



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,402	09/16/2003	Ryosuke Hiyoshi	023971-0308	9672

22428 7590 07/06/2006

FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER

HARRIS, KATRINA B

ART UNIT	PAPER NUMBER
----------	--------------

3747

DATE MAILED: 07/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/662,402	Applicant(s) HIYOSHI ET AL.	
	Examiner Katrina B. Harris	Art Unit 3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 13 and 15 is/are rejected.
- 7) ☒ Claim(s) 6-12 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/16/03, 1/12/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moteki et al. (2002/0002957) in view of Stearns (1,959,279). Moteki et al. discloses, as in **claims 1 and 15**, a link mechanism comprising :
a first link (3) including a cylindrical first pin boss portion (21);
a second link (4) including a cylindrical second pin boss portion (22); and a connecting pin passing through the first and second pin boss portions so as to allow a relative rotational movement between the first and second links within a limited range;

Moteki et al. does not disclose a first narrow section extending in a circumferential direction of the first pin boss portion, a first wide section extending in the circumferential direction of the first pin boss portion, a second narrow section extending in a circumferential direction of the second pin boss portion and a second wide section extending in the circumferential direction of the second pin boss portion, and having an axial wall thickness greater than the axial wall thickness of the second narrow section; the first wide section of the first pin boss portion and the second wide section of the second pin boss portion overlap each other in the axial direction.

Stearns discloses a first narrow section, a first wide section, a second narrow section and a second wide section (as shown in figure 7)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the link of Stearns in the invention of Moteki et al. to provide sufficient clearance between the faces of the piston and the link.

Regarding **claim 2**, Stearns discloses wherein the first wide section confronts the second narrow section in the axial direction, and the second wide section confronts the first narrow section in the axial direction.

Regarding **claim 3**, wherein the second link (4) includes first and second side walls each formed with the cylindrical second pin boss portion, the first wide section of the first pin boss portion is placed in the axial direction between the second narrow sections of the first and second side walls, and the first narrow section is placed in the axial direction between the second wide sections of the first and second side walls.

Regarding **claim 4**, wherein the link mechanism further comprises a third link(7) linked with one of the first and second links, to form a linkage of the first, second and third links, connected between a piston of an internal combustion engine, and an actuating section to vary a compression ratio of the engine; and wherein one of the first and second links is a lower link rotatably mounted on a crank pin of a crankshaft of the engine.

Regarding **claim 5**, wherein the first and second links are so arranged that a combustion load due to combustion pressure acting on the piston is applied to the connecting pin from the first and second wide sections.

Regarding **claim 13**, wherein the lower link includes a main bearing portion formed with a hole for receiving the crank pin, and first and second swing arms which project from the main bearing portion in different directions and which are connected, respectively, with the other links.

Allowable Subject Matter

Claims 6-12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 3747

Conclusion

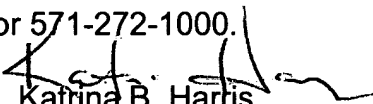
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent No. 2006/0101939 disclose a similar system which shows, in figures 2-7, a link having first and second narrow and wide sections.

Communication


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katrina B. Harris whose telephone number is 571-272-4842. The examiner can normally be reached on 5:30 AM -2:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Cronin can be reached on 571-272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Katrina B. Harris
Examiner
Art Unit 3747

KBH


Tony M. Argenbright
Primary Examiner
Art Unit 3747